

# W5YI

Nation's Oldest Ham Radio Newsletter

## REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable. May be reproduced providing credit is given to The W5YI Report.

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## FCC AUCTIONS OFF SPECTRUM FOR PCS SERVICES

As scheduled, the FCC has begun its massive sale of spectrum that will be used to construct and operate the next generation of cellular telephone systems. The auction which began on December 5th will last for weeks ...and perhaps months. It was the second major auction of radio frequency spectrum. The first narrow-band auction of licenses to provide two-way paging and interactive television raised more than \$1 billion this past summer.

At first thought, the wide-band auction was expected to raise some \$10 billion for the U.S. treasury. Now we are seeing figures like \$15 billion. Just how much the final figure will be is actually anybody's guess. One thing is for sure, however. It will be the largest sale of public assets in history.

The published estimates are not coming from the FCC who seem a little embarrassed by the reports. Chairman Reed Hundt said "The companies that will be bidding will make the determination of what they are willing to spend. We can't possibly know enough about business plans to guess accurately."

In any event, the money raised will be 100% more than first generation cellular licensees had to pay. The previous licensing system initially awarded spectrum free of charge ...either through lotteries or comparative hearings.

We emphasize the word "initially" because many licensees resold their spectrum rights to

others at huge profits. That kind of irritated the government. They believe any income from the sale of publicly-owned spectrum belongs to the U.S. taxpayer.

Over the past couple of months, various companies and alliances have filed applications for various area licenses and therefore have signaled their intention to bid. Earnest money payments based on the size of each market on which a company plans to bid had to be deposited with the federal government by November 18th.

At issue are 99 wideband PCS licenses (each 30 megahertz wide) in 51 MTA's (major trading areas.) To stimulate competition (and lower prices to the consumer) two licenses will be sold per MTA. Two times 51 is, of course, 102. But three areas (New York City, Los Angeles-San Diego and Washington-Baltimore) have already been awarded to trailblazing companies at discounted prices under the Commission's "pioneer's preference" rules. Together, these MTAs serve two-thirds of the U.S. population.

When you add in the smaller markets going on the block next year, more than 2,000 PCS spectrum licenses will eventually be auctioned off. There will be five licenses sold in each of the nation's 492 smaller BTA's (basic trading areas.)

You say a few megahertz at 1.8 gigs doesn't seem like its worth \$10 or 15 billion to you? Well, let's take a look at some of the statistics we know about and apply them to PCS.

## The numbers of PCS

The radio spectrum is a measurable natural resource ...not unlike oil or land. Its value to a businessman is based on what you can use and sell it for ...and still make a profit. We have had oil booms and land rushes. Now it's the spectrum surge.

The older, analog 800-Mhz cellular phone service began operating in 1983. Now some 12 million cellular phone subscribers are each producing about \$80 in monthly revenue to providers. Some more, some less.

That may not sound like much but if you do the mathematics, that comes to about \$10 billion a year. And that is just for air time! The impact to the U.S. economy is "scillions" more when you consider marketing (just look at the ads in your newspaper) and equipment costs. Even though it may appear "free," the average cellular phone costs a couple of hundred bucks. It's given away by cellular companies as an investment on the future.

The number of cellular subscribers continues to expand tremendously ...far out pacing even the wildest expectations of a decade ago. And keep in mind that cellular phones are still only used by a tiny fraction of the U.S. population. *Business Week* estimates that there could be 70 million "regular" cellular subscribers within five years. That's a five-fold increase!

Is it then reasonable to expect that PCS phones might also exceed estimates? What happens if 50 million people pay an estimated \$35 a month? That is more than \$20 billion a year. Regular wireline telephones are geared to multiple users and fixed locations. PCS pocket phones, on the other hand, are furnished to people who move around. The new service will give each individual a separate handset and telephone number.

The system is really not that much different from a ham radio repeater with users who each have a call sign. A PCS "microcell" is small - about a half a mile in diameter - so more cell sites are required than for cellular. Hundreds of transmitter/receiver sites will be needed to cover a large city. And like cellular, when one PCS microcell loses contact, the next "repeater" picks it up.

What is the potential market ten years from now? 100 million, 200 million? Who knows? The numbers are all mind boggling!

## Just what is PCS?

Personal communications services (PCS) is considered to be the next technological wave of the future. If you believe the hype, everyone will be carrying a light-weight shirt-pocket communicator ...or pager ...or personal digital assistant (PDA) by 1998.

Its 1.8 GHz low power (only one to ten milliwatts compared to 3 watts for cellular) means that handsets and transmitting cell sites can be smaller and cheaper. Batteries will last longer - about 8 to 10 hours of "talk time" per charge.

System capacity will be dramatically increased since PCS' digital signals can be multiplexed. Digital audio is clearer and less prone to interference. And digital programming allows providers to offer all sorts of special features including easy scrambling for security purposes. On paper, this means better quality service and lower costs to the public.

When everything is taken into consideration, a one time charge averaging \$5 or \$10 per potential subscriber (amortized over 20 years or more) all of a sudden doesn't seem that high to a potential PCS provider.

The cost of the spectrum license, however, is only about one third of the cost of building the PCS network. One research company estimated that network construction in the 99 MTA's being auctioned off will cost providers an additional \$20 million (for Tulsa) to \$420 million (in New York.)

Each spectrum winner has a five year time frame to provide service to one-third of the markets in which they obtain license. Palo Alto researcher, Killen & Assoc., predicts it will cost some \$500 billion to complete the new PCS networks over the next ten years. This is the type of "big bucks" crap-shoot that the telecommunications industry is wrestling with.

## The PCS players

The highest bidder probably will be the Sprint Corporation which has teamed up with three other large cable television companies. We heard that the cable companies have a plan to attack the local telephone market. Originally MCI was to be the long distance carrier for the cable TV consortium but that deal fell through.

Some "Baby Bells" are welcoming the competition since they believe it will expedite further industry deregulation. They want to set their own rates and enter other business opportunities. Effective competition in their market will speed their requests.

The Sprint "WirelessCo" alliance forked over nearly one quarter (\$118 million) of the total \$522 million "up front" earnest money paid by all 30 bidders. AT&T was second with \$78.3 million.

Initially, there were 74 potential bidders who declared their intentions on October 28th to participate in the auction, but 44 dropped out - at least out of the MTA portion. Some will undoubtedly bid when the smaller market licenses are auctioned.

By and large, the thirty companies participating

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are the nation's largest long-distance/regional wireline telephone, cellular and cable companies. They include big name firms like Bell Atlantic, Ameritech, US West, McCaw Cellular, Southwestern Bell, Tele-Communications, Inc., GTE, Pacific Telesis, Cox Cable, Comcast Corp., Cablevision Systems Corp., Continental Cablevision, Nynex Corp, etc.

And what effect will PCS have on 800-MHz cellular? Not to worry. Today's cellular telephones will not be going the way of the horse and buggy. Quite the contrary. You can anticipate that competition from PCS (still two or three years away) will mean lower cellular prices too.

Analog cellular has already started their switch to digital which can service ten times more users per cell site with increased clarity, privacy and other features. PCS and cellular could ultimately become indistinguishable ...much like the VHF and UHF television bands are today. There will be difference, but you won't notice most of them. Cut-throat pricing will be the rule. The wired telephone networks will lower their rates to compete.

## The auctions begin

So far, the spectrum sale is going slower than anticipated. Vice president Al Gore opened the auction on Monday, December 5th by dangling a mock-up of a Dick Tracy-like wrist watch to the audience. He mentioned portable e-mail possibilities and suggested that part of the money raised from auctions should be channeled into linking classrooms to the information superhighway.

Another speaker, Rep. Edward Markey (D., Mass.) recommended that part of the auction money should go to public broadcasting ...especially children's programming. But it was all wishful thinking. The law will have to be changed before the funds go anywhere except into the U.S. treasury.

The pendulum has now swung from far left to far right. Instead of offering free service and spectrum to the public, the Commission is now in the business of charging for its regulatory and license processing service ...and selling spectrum to the highest bidder! The FCC auctions will fill the government coffers with the most revenue ever developed by any federal agency.

## Statement of FCC Chairman

FCC Chairman Reed Hundt wanted to dispel any notion that the agency was raising funds at the expense of industry. "The primary reason we're holding these auctions is to create competition, not raise revenues," he said. "By creating competition, we will increase the quality and range of services available, and we will lower prices to consumers. We can put many

more dollars in consumers' pockets by doing this than we can by redistributing auction revenues."

"For the auctions to be a success, it doesn't matter how much we raise. What matters is whether we award licenses efficiently and quickly to those who value them most highly and who will compete most aggressively. If we succeed in this goal, we will create the greatest number of new jobs and stimulate new capital investment..."

"The savings to consumers and the investment and jobs the auctions will produce will be larger and more important than any revenue we could raise for the federal treasury."

## First round bidding

At the end of day one, the bidding was only up to a paltry \$400 million in the first round and so far no licenses have been awarded. (But that amount is still double the FCC's annual budget!)

To begin with, there will be one round a day during which all licenses are auctioned at the same time. The auctioning of all licenses simultaneously allows buyers to assemble blocks in adjoining market areas. Strangely, no bids were entered on half of the available licenses during round one.

We attended a commercial radio meeting last month which was held at the FCC Auction site located on the first floor of the downtown Postal Square Building. Now a museum, it used to be Washington, DC's main post office.

There are twenty bidding booths off to the left side of the main hall which are hooked up by PC and modem to various corporate war-rooms around the country. Although all bidders attended the opening round on December 5th, most will place their bids remotely in the future through the bidding booth process.

The bidding for the largest of the 99 MTA's is up to about \$50 million. One bidder even started the auction for the Tulsa license at the unbelievable low price of \$10 (ten dollars)! That brought a laugh from the audience!

But it is early ...and the opening approach is to be cautious. Most of the players are using consultants who have devised bidding strategies that exploit the FCC's auction system. It is like a high stakes poker game. You can be sure that the bidding will get hot and heavy before it's over.

## NEW WIRELESS TELECOMMUNICATIONS BUREAU

Effective December 1st, the FCC's Private Radio Bureau is now the Wireless Telecommunications Bureau. The new bureau will handle all FCC domestic wireless telecommunications programs and policies except those involving satellite communications.. Its

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functions will include all activities of wireless telecommunications providers and licensees. The bureau also will serve as the Commission's principal policy and administrative resource with regard to spectrum auctions.

Regina M. Keeney has been named as the Chief of the new bureau. Ralph A. Haller and Gerald P. Vaughan are the Deputy Bureau Chiefs.

Before coming to the FCC in October, Keeney served as the Senior Republican Counsel for Communications to the Senate Committee on Commerce, Science, and Transportation. For nine years, she advised senators on all areas of communications, including telephone, broadcasting, cable and wireless services.

Prior to that, Keeney worked at the FCC for two years as an attorney in the tariff division of the Common Carrier Bureau. She received her B.S. from Georgetown University and holds a J.D. from Harvard Law School.

Keeney said, "The Wireless Telecommunications Bureau will ensure that the FCC is at the forefront of policy making for wireless communications services, including cellular, paging, personal communications services, public safety and other commercial and private radio services. Our goals are to promote economic growth, foster competition, and enhance accessibility of emerging technologies to consumers. Additionally, the Bureau will work to foster efficiency and innovation in the allocation and licensing of the electromagnetic spectrum."

The Wireless Telecommunications Bureau will have seven divisions: Commercial Radio Division, Enforcement Division, Policy Division, Auctions Division, Private Radio Division, Licensing Division, and Customer Services Division.

- The Commercial Radio Division will develop policy, rules and procedures for other authorization and regulation of wireless telecommunications facilities and services. The Division is responsible for rule making and regulatory matters concerning Cellular Services, Personal communications Services, paging and Specialized Mobile Radio, Air-Ground, and Basic Exchange Telecommunications Radio Services.

- The Enforcement Division will ensure compliance by wireless telecommunications service providers and subscribers with the Communications Act, other statutes, and Commission rules, orders and policies. This division will administer the FCC's EEO Program for wireless telecommunications service providers, and respond to public information inquiries concerning rates or practices, among other duties.

- The Policy Division will, based on major technical, economic, and regulatory developments, legislative actions, and Commission and court decisions, propose and develop Commission rules and policies to govern wireless telecommunications services.

- The Auctions Division is responsible for conducting the

auctions of the electromagnetic spectrum. These responsibilities include recommending appropriate auction methodology for particular services, marketing, application processing, and development of all auction-related contracts. Additionally, this division will advise the Commission on policy, engineering, and technical matters relating to auctions of spectrum used for other purposes.

- The Private Radio Division will handle rule making and regulatory matters concerning Public Safety, Industrial, Land Transportation and other private mobile radio services, Aviation, Marine, Amateur, IVDS (Interactive Video Data Service), broadcast auxiliary service, Personal Radio Services, point-to-point microwave, antenna tower clearance, and the radio operator examination program. Additionally, this Division will project demand for existing and possible new communications requirements and services.

There will be no branches or Branch Chiefs within the division. Special Services Division Chief, Robert H. McNamara heads up the new Private Radio Division with Herbert W. Zeiler, Deputy. Staffers include John B. Johnston, Kathryn Hosford, Monty J. DePont and Robert James.

- The Licensing Division will oversee the processing of applications and licensing of Specialized Mobile Radio, paging, Private Land Mobile, Private and Common Carrier Microwave, Broadcast Auxiliary, amateur radio, IVDS, aviation and marine and General Mobile Radio Services.

- The Customer Services Division will be responsible for providing technical assistance to consumers, manufacturers, frequency coordinators, and others on questions related to application processing and licensing in the wireless telecommunications services. The Customer Services Division will also provide automated support, processing, and data services for the Licensing Division and for the Bureau.

- The Associated Press said from Sarajevo, Bosnia-Herzegovina that communications coming out of the besieged "safe area" of Bihac are being handled by ham radio. The transmissions reflect the desperation of those who feel betrayed and abandoned by the international community. Because of heavy fighting, Bihac is unapproachable.

"There are more and more casualties, a lot of them children," ham operator Mirza Sadikovic said by radio as Serb forces closed in on the U.N.-declared safe zone. A Sarajevo radio operator arranged the call for the Associated Press. During his brief radio transmission, Sadikovic appeared excited that he had been called by an international news organization.

"There are too many wounded. There is no space," Sadikovic said of his town's hospital. "Surgeons are operating on the floors of the hospital without any anesthetic. Shelling goes on at the very center of the city."

As the transmission ended, Sadikovic asked that someone call again, just to assure them the town had not been forgotten. "Thank you for your effort and interest," he said respectfully. "Please stay in touch."

## INTEL AND MAGELLAN HAVE PR PROBLEMS

Fueled by the media, the two biggest names in PC chips and mutual funds have had recent failures which have tarnished their public image as the biggest and the best. The negative impact on the public may be more psychological than actual, however.

It seems that a computing flaw was found in Intel Corp's flagship *Pentium* microchip. Intel has known about the defect for some six months now, but continued to ship the flawed chips anyway. They have sold some 2 million *Pentiums*.

The computing world found out about the problem when Intel quietly posted a note concerning the flaw to an online Internet Newsgroup. The letter said "We would like to find all users of the *Pentium* processor who are engaged in work involving heavy duty scientific/floating point calculations and resolve their problem if necessary by replacing their chips with new ones."

That set off mass hysteria among *Pentium* owners who pride them self on having the best "Intel Inside" chip. Intel is dealing with the mathematical precision malady on a case-by-case basis because the defect only affects calculations nine places to the right of the decimal point. A joke on the Internet contends that the reason Intel named its latest chip the *Pentium* instead of the 586 is because when you add 100 to 486, it equals 585.9956387.

The flaw itself does not present difficulties to anyone except engineers and mathematicians. Extremely few PC users need accuracy beyond one billionth of one cent or ( $-10^9$ ).

When word got out, however, the resulting publicity about the defect made users suspect they had a worthless computer. Many PC buyers felt that the marketplace should have been immediately informed, shipments stopped and defective chips recalled.

Two of Intel's largest customers (Compaq and IBM) have either reduced or cancelled orders for the microprocessor. They felt that a known flaw detracted from the chip maker's (and their) image of quality. Compaq even developed an "interim solution", a software patch to disable the flawed portion of the flawed *Pentium* microprocessor.

The world's largest mutual fund, Fidelity's Magellan, also is licking its wounds. In late November, Fidelity announced they would distribute \$4.32 a share to share holders at year end. Like stock-splits, distributions make investors happy. Somehow share holders relate them to "free money." On Monday, December 5th, Fidelity cancelled the distribution saying they were sorry, but they made an error.

Three million shareholders hold 536 million shares of Magellan worth more than \$36 billion. That makes the amount of the mistake nearly \$2.5 billion.

Some unnerved investors thought they were out a lot of money caused by the pre-Thanksgiving slide in the stock market and higher interest rates. Such is simply not the case. No one is out a dime!

Year end distributions only represent "a taxable event" ...income received from interest paid or profit on securities sold during the year. If anything, the error means shareholders pay less taxes. The presence or absence of dividends has no effect on the total value of an investment. If you take the dividends in the form of a separate check, your investment goes down accordingly. Most people simply re-invest all dividends. In either case, the total is the same.

While no damage has really been done, embarrassed Fidelity and Intel are both scrambling to save face and to convince the public that (1.) Yes, an error was made, and (2.) No, it won't affect you. The unanswered question remains in both cases is, however, "How did it happen?" The only explanations thus far, are "...human error."

● **Prodigy, the nationwide online computer service, also seems to be having some problems.** At least they are laying off employees and overhauling their network. The Wall Street Journal confirmed their second major downsizing in two years.

Prodigy was the first major consumer online service, but they face formidable competition now. Over the past eleven years Sears-Roebuck and IBM have spent more than \$1 billion building Prodigy. The company has never showed a profit.

Two years ago, Prodigy had the most subscribers of any online service. They are now in third place. Both America Online, Inc. and CompuServe are more popular. The reason is apparently an error in market judgement. Prodigy aligned itself with the commercial and advertising sector while other services courted the end user. And Prodigy has been slow to change due to their Sears and IBM bureaucratic heritage.

AOL, the current leader and by far the fastest growing service, has streaked from 200,000 to 1.3 million subscribers in just two years.

Prodigy will upgrade its features early next year to include a slick new screen appearance and fast entrance into the Internet. Its new "look" will permit subscribers to cluster with others of like interest and to access similar services on the Internet. It is also testing cable-TV modem delivery at 100K baud - ten times faster than the current phone line service.

The consumer online service business continues to be very competitive. Although about 6 million people now use an online service, that represents less than 5% of the U.S. households. The big swing by online services today is towards the Internet.

And get ready for AT&T's new interactive Imagi-Nation Network consumer online service.

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## UPDATE ON DIRECT BROADCAST SATELLITES

In a word, DBS television seems to be a "hit." And it is not just the people that don't have cable-TV that are subscribing. About half of the people buying satellite-delivered television previously subscribed to cable. That has cable operators concerned and they are waiting for the right moment to unleash an already prepared anti-DBS campaign. Not all DBS subscribers are discontinuing cable hookups, however. Some are supplementing cable with a DBS dish.

Right now there are now three Direct Broadcast Satellite systems in operation. Two, (GM-Hughes) DirecTv and (Hubbard Broadcasting) USSB use a small 18-inch DBS dish. Lower-power PrimeStar, which is owned by cable operators, requires a larger dish. It is scheduled to increase power and also go to an 18-inch dish in 1996. Newcomer EchoStar plans to launch two DBS satellites in 1996. The will make four DBS operators.

By year's end, DirecTv and USSB are expected to have about 400,000 subscribers each, PrimeStar: 200,000. Programming for each costs about \$30 a month.

DBS hookups in Rural America are doing particularly well. The biggest hangup is still a shortage of the Digital Satellite System (DSS) receiving equipment produced by Thomson Consumer Electronics which makes RCA products. Both the DirecTv and USSB DBS service are received on this equipment which must be purchased by the subscriber. The DSS system including the 18-inch satellite dish costs between \$600 and \$899 plus another \$150 to \$200 for installation.

People are buying the receiving equipment faster than Thomson can make them. The DSS System does not carry local stations, but allows them to be received either over the air or via cable.

USSB's 20-channel programming is typical cable fare. DirecTv has an extensive list of pay-per-view offerings with up to 150 channels available. DirecTv and USSB do not have the same programming. To get a full slate, you must buy both sets of programming. PrimeStar leases their DBS equipment to subscribers.

DirecTv and PrimeStar have both signed deals that will offer more than 400 National Basketball Association games to direct broadcast subscribers. DirecTv also holds rights to regular season NFL football games. For \$49.95, subscribers have access to all Sunday NFL games.

Cable operators are embarking on a DBS bashing campaign by pointing out that DBS doesn't provide local programming, customer service or free equipment repair.

## UNATTENDED "ROBOT" BROADCAST STATIONS

On December 7th, the FCC released a *Notice of Proposed Rule Making* which proposed to waive the requirement that an AM, FM and TV broadcast station have a licensed radio operator on duty in charge of the transmitter ...and to allow unattended operation.

Congress recently passed legislation which permits the FCC to consider this option. The law currently requires that the transmitting apparatus of any licensed radio station be operated only by FCC licensed personnel. The FCC pointed out, however, that its rules hold the broadcast station licensee responsible for the proper operation of the station.

The majority of broadcast duty operators hold only the *Restricted Radiotelephone Operator Permit* (widely called the RP) which is the lowest class of commercial radio operator license. It does not require passing a written examination or otherwise demonstrating knowledge of station operation. There is a nominal application fee (\$45) and the RP is valid for life. The Commission believes that "...the requirement that a duty operator possess an RP has little or no impact on the quality of a broadcast station's operation."

The FCC said that "...reducing the application filing burdens and costs imposed on those station employees is part of our effort to reinvent government. Eliminating the application processing requirement will also save Commission resources."

The Commission also proposed to update various transmitter control requirements to make them more relevant to unattended operation. Unattended operation is defined as the substitution of automated supervision of a station's transmission system for human supervision. The station transmitter is automatically turned off and on and all of its functions are performed without a person being present.

New Part 73.1300 will provide for "...unattended operation where automated monitoring of station operating parameters are employed." No prior approval is required to operate a broadcast station in the unattended mode, but the FCC must be so notified.

"Our basic premise in this proceeding is that the requirement for a licensed duty operator and the costs and burdens imposed by such requirement no longer appear to be necessary or appropriate in light of many improvements which have been made in the stability, reliability and automatic control of transmission systems. ...modern monitoring and control equipment has rendered the need for the duty operator largely superfluous for a great many stations, and this level of automation should be readily available to most broadcasters." (Comments close on January 20, 1995. Replies: February 6, 1995. - MM Docket 94-130)

**VITAL MEDICAL SYSTEM BLOCKED:** The Austin County Emergency Medical System (EMS) complained that their communications system was receiving harmful interference. Using mobile direction finding techniques, an FCC investigator from the Houston office tracked the interference to a shrimp boat docked at Freeport, TX, approximately 75 miles from Austin County. The shrimp boat was operating on the EMS frequency to communicate with other shrimp boats at sea. The FCC will conduct an educational campaign to familiarize the predominantly Vietnamese shrimp boat fleet with radio licensing requirements and proper use of marine radio. Bulletins will be translated into Vietnamese and meetings will be held with the assistance of a translator. The FCC is also pursuing enforcement action against the vendors of radio equipment used by the shrimpers.

**PAGING INTERFERENCE:** The FCC's San Juan Office issued 55 warning letters to most of the paging companies in Puerto Rico and the Virgin Islands. The FCC believes that better compliance with the Commission's technical rules will reduce the problem. Interference cases have suddenly mushroomed with the tremendous growth of private carrier paging on the islands. The FCC said that compared to their common carrier counterparts, private carriers seem to have insufficient resources to maintain proper operation of their transmitters which causes interference to properly operating systems.

**INTERFERENCE TO SAR SATELLITE:** The Air Force Rescue Coordination Center contacted the FCC's watch officer to report interference to the Search and Rescue Satellite Aided Tracking (SARSAT) system used to locate crashed aircraft and ships in distress. The SARSAT system determined that an interfering signal was originating from the Seattle, WA area. Engineers from the FCC's Seattle office using a mobile direction-finding vehicle equipped with a new mapping package discovered a discarded emergency transmitter beacon operating in a pile of rubbish on the deck of a commercial fishing vessel.

**EMERGENCY BEACON:** In another similar incident, The Coast Guard contacted the FCC's Los Angeles office about interference on an emergency beacon frequency which is used when a vessel is sinking. Using direction-finding equipment, FCC engineers pinpointed the interference to an under cover vessel operated by the U.S. Customs Service docked at a marina in Wilmington, CA. Customs agents had removed the emergency beacon from its mounting to hide it from burglars and, in the process, activated a distress call.

**STILL MORE INTERFERENCE TO SAR SATELLITE:** Engineers from the FCC's Seattle Office responded to a request for assistance from the Lanley Air Force Base Rescue Coordination Center (RCC). The Search and Rescue Satellite was receiving interference on its 121.5 and 243 MHz distress frequencies. The "hit" area defined by the satellite encompassed about eight square miles. A mobile direction finding unit detected power line noise which was excessive at one location. When the investigator shook a guy wire, the noise signal dropped significantly. The SARSAT operations center confirmed that the interference had stopped. The power company was advised to check the pole and loose hardware and

connections were found.

**NORFOLK AIRPORT INTERFERENCE:** Air traffic control at the Norfolk International Airport called the FCC's Norfolk office to report unauthorized voices on an FAA VHF band frequency. The tower was asked to record the transmissions. The recordings mentioned a "nail inspection" and an address. An FCC engineer drove to the address only to find a roofing crew but no radio. A building inspector had just left the site. Following the lead, the FCC investigator uncovered a defective portable radio being used by the building inspector. The radio was replaced and the interference ceased.

**MOBILE RADIO FRAUD:** A Miami local government agency advised the FCC that it was "purchasing" a police radio frequency from another FCC licensee for \$60,000. Noting that the sale did not include equipment, the FCC monitored the frequency and discovered no activity even though this system reportedly had been upgraded to authorize more mobile units. An FCC inspector visited the transmitter site and found that the seller had never constructed the station. Based on these findings, the FCC advised the city to file a finder's preference application with the FCC in Gettysburg instead of completing the proposed purchase of a non-existent system, thereby saving the local government agency \$60,000.

**STUCK GARAGE DOORS:** The manager of the Sears store in Omaha, NE contacted the FCC's Grand Island Office to report that dozens of dissatisfied customers were complaining to the store that their Sears garage door openers would not open once closed. Several local amateur radio operators heard of the problem and assisted the FCC in the investigation which uncovered a source of radio interference at the Offutt Air Base. FCC contacts with the Air Force revealed that the Air Force had installed a new air-to-ground communications system that used a radio frequency too close to the frequency of the garage door openers. The communications system effectively jammed the receivers used to pick up the far weaker garage door transmitters. The Air Force contractor agreed to coordinate with the FCC to find a new frequency for the air base communications.

**RUSSIAN INTERFERENCE:** FCC engineers in the Seattle area were notified of a safety interference problem affecting the communications of Forestry Service smoke jumpers who were fighting fires in the area. Using a new GPS mobile-direction finding and mapping vehicle, the FCC traced the problem signal to the Boeing Control Tower in Everett, WA where the Russians had placed a transmitter on the air, testing it in preparation for President Yeltsen's visit. The transmitter was voluntarily shut down and the Russians were advised of the proper procedure for obtaining frequencies.

**AMBULANCE SERVICE INTERFERENCE:** The FCC's Kansas City office received a complaint about "foul" language business radio operation on a rural ambulance service frequency. FCC engineers tracked the signal to a tractor-trailer service using the frequency to coordinate traffic at loading docks at a Ford assembly plant. The radio company that installed the radio equipment had mistakenly programmed it with the ambulance frequency.

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## Technology Advances in Communications, Electronics and Computers

### ■ As of 1 Nov. 1994, there is officially no such thing as a cable-ready TV!

The FCC kicked in a new set of rules for cable compatibility for television sets, VCRs and other consumer electronics items. So far, no manufacturer has met them. If a new TV or VCR is advertised as being "cable ready" or "cable compatible" without meeting these new guidelines, then the seller is breaking the law.

Still, cable companies are required to transmit local over-the-air channels in a non-scrambled manner. So any TV or VCR available in the stores for the holidays will be able to show that much. 1 January 1997 is the deadline for consumer electronics manufacturers to upgrade their products. Any equipment that doesn't follow the rules must be prominently labeled as such.

■ **Apple Computer, Inc., is giving their famous Macintosh computer an inside-and-out facelift.** The Mac has gone through many changes already since first released in 1984, but Apple says the new changes, which will take two to three years, take the company into regions never before explored. Apple wants to do this to reduce hardware manufacturing costs, allow outside (licensed!) companies to make hardware clones, and expand the Macintosh market overall.

Many computer companies have developed Macintosh clones in the labs over the years, but Apple's legal staff has kept them all out of the stores because the on-board software is proprietary. Tandy created one, for example; perhaps this new development could mean that Mac clones might someday be available at Radio Shack stores.

### ■ **NASA launched a satellite called Wind on 1 November, 1994, to examine the mass, momentum and energy of the solar wind for the next three years.**

Wind is the first of two spacecraft in the Global Geospace Science program, which will alert scientists to heavy bursts of solar activity. Such geomagnetic storms generate the beautiful northern and southern lights, create ideal skip conditions for hams, and damage radar systems and sensitive electronic equipment. One 1989 solar blast tripped the power lines in Quebec.

■ **A new method of cramming over two hours of full-motion video with 16 bits' worth of digital audio on a CD-ROM is in the works.** Companies working on it include Philips and Sony (which developed compact discs in the first place), Toshiba, Time Warner, and JVC. Current CD-ROMs can't show more than 70 minutes of compressed video.

The compression technique involves a smaller pitch for the "groove" of digital data stored on the disc. Making it narrower leaves more room. But with so many companies each working on a standard, one must be universally agreed upon before it will be successful in the marketplace. -- *Byte*, Oct. 1994

■ **The term "supercomputer" no longer necessarily means a gigantic machine in a single room used by a privileged few.** Today a supercomputer is made up of an entire network of individual machines, linked together and used by large groups of users to solve a single problem.

The U.S. government's High Performance Computing and Communications (HPCC) program is developing a high-speed network protocol that will move cells of multimedia data 54 bytes wide at a speed of 622 megabytes per second between desktop computers and supercomputers. The goal: teraops. Teraops means trillions of operations per second, and that should be met by 1997. The ideal supercomputer (which doesn't exist yet) offers a teraflop of computer power, a terabyte of memory, and a terabyte per second of bandwidth between the CPU and memory. -- *Aviation Week & Space Technology*, 28 Nov. 1994

■ **With certain airplanes being grounded due to icing problems, it's reassuring to know that someone is trying to solve the problem.** The Lewis Research Center in Cleveland, Ohio, has come up with a new means of de-icing airplanes while in flight. It's called eddy-current electromagnetic-repulsion deicing.

This technique, while not new in itself, plants electromagnet coils within the wings or other surfaces that accumulate ice. Upon command, a fully charged capacitor dumps its energy through an electromagnet coil. As hams know, current flowing through a coil generates a magnetic field. This

magnetic field, brief but powerful, generates eddy currents in a nearby conductive surface. In this case, a piece of a wing gets flexed, just enough to break the ice and let it fly free. The new technique consumes less power than older systems, and can remove more ice than previous systems using the same technology. -- *NASA Tech Briefs*, Oct. 1994

■ **"Hacking" telephone systems remains popular.** An MCI employee was arrested in October for massive calling card fraud. Cellular telephone hacking is becoming more prevalent, and black-market cloning kits already exist. Stealing cellular control codes allow crooks to break into the networks without paying for the services.

Even the hardware isn't safe. Police departments report that burglars like to steal cellular telephones from cars for one reason: the rechargeable battery packs. They are expensive and there is great demand for them. Officials recommend taking your cell phone with you whenever you leave your car. -- *Communications News*, Dec. 1994

■ **What are the limits to the amount of memory packed onto a chip?** There may not be any. Samsung Electronics announced their development of the first 256-megabit dynamic RAM chip. It should be commercially available within three years. Just one chip can contain over 2,000 newspaper pages' worth of data! -- *Electronics Now*, Dec. 1994

■ **A well-written article on radio-frequency interference (RFI) from power lines** by Jody Boucher (WA1ZBL) and Edward M. Greb-Lasky appeared in the November 1994 issue of *Transmission & Distribution* magazine.

According to their experience a new method of tracking down RFI uses ultrasonic listening devices. When an electrical disturbance occurs, the electricity ionizes air molecules which produce a distinct, detectable ultrasound signal. This region of sound ranges from 20 kHz up to 100 kHz, far above human hearing.

Handheld ultrasonic detectors allow troubleshooters to walk around a specific pole, using line of sight to find loose nuts and bolts, corroded connections and cracked insulators. Ultrasonic RFI tracking can be used up to 300 feet away, and greatly speeds up the time required to find the problem.

• The preliminary comment period is over on **Tandy/Radio Shack's proposal to create a new unregulated and unlicensed Family Radio Service.** (FRS is assigned File No. RM-8499.)

The new service would be located in the 462 and 467 MHz GMRS (General Mobile Radio Service) bands. FRS would make wider use of two existing GMRS repeater frequencies and 14 simplex frequencies sandwiched in between the eight existing paired channels ...the so-called direct-only "interstitial" frequencies. The repeater frequencies would be the 462.675/467.675 MHz duplex channel widely used for traveler-assistance communications.

The new service would use 500 mW narrowband FM transceivers which can operate effectively on flashlight battery power. Tandy/Radio Shack is already testing GMRS unlicensed FRS communications in some markets under an FCC-issued STA (Special Temporary Authorization) and has sold hundreds of their Model PRS-100.

GMRS got its start in 1947 when the FCC allocated the 460-470 MHz band to a 50 channel UHF personal radio service back in 1947. It was the initial Class "A" Citizen's Band. But the transfer resistor (transistor, as it later became known) was not yet invented and the cost of UHF transceivers proved too high for the mass market. Noting this, the FCC reallocated some of the 460 MHz band to business interests. What remains to this day are eight paired personal radio channels.

Not many formal comments or reply comments were filed on RM-8499 but those that were came only from two areas. GMRS users community firmly opposed the FRS. Their position was:

1. Mixing licensed and unlicensed operators on the same frequencies will not work;
2. Harmful interference will be caused to existing GMRS operations;
3. The current "professional quality" GMRS will deteriorate into "consumer-grade" communications;
4. And the primary interest of Tandy (and other commercial interests) is to sell a ton of cheap radios without regard to the consequences.

As one might expect, comments from the commercial sector were unanimously in favor of implementing a Family Radio Service.

1. Motorola supported Tandy/Radio Shack and noted recent Congressional authorization to de-license GMRS. They suggested that FRS be given co-primary status. Motorola believes opposition to the Family Radio Service is due to the desire of GMRS users to keep their numbers low. They feel that "...the FCC should be seeking regulatory policies that encourage the widespread use of radio."
2. The Mobile and Personal Communications Division of the Telecommunications Industry Association believes the Family Radio Service would have broad market appeal - but only if it were an unlicensed service.
3. Tandy contended in its reply comments that the American public has long needed convenient, high-quality, short range communications which is currently unavailable.
4. Uniden agreed with Motorola and Tandy that FRS would be a broadly popular service. They did not feel that low-cost, low-quality radios would overrun the spectrum ...nor would FRS cause interference to current GMRS users.

The FCC will now have to decide whether to go forward with a Notice of Proposed Rule Making ...or dismiss the proceeding. The Commission could also issue a broad-based inquiry into the need for a short-range unlicensed public communication service. Action is expected in the Spring of 1995.

• **David/WA4NST and Sharon/N4XLF Brower of Vero Beach, Florida have lost their appeal to have an external ham antenna at their residence.** It seems a neighbor does not like the way it looks and the Brower's transmissions interfere with their electronic devices. This legal proceeding began four years ago.

On January 15, 1993, Judge Charles E. Smith of the 19th Judicial Circuit Court ruled that "...amateur radio transmissions are noxious and offensive" and the appearance of a tower and antenna are "...an eyesore annoyance and nuisance to the neighborhood" and as such violates the deed restrictions.

He further said the tower was a "building" which exceeded the two story limit in the deed restrictions and must be removed. According to the Browsers,

the deed restrictions in their subdivision are silent about external antennas. An appeal was filed the following month and the tower was allowed to remain pending the outcome of the appeal. But the Browsers have been unable to operate ham radio (for nearly two years) during the appeal process.

A panel of three judges from the 4th District of Appeals has now agreed (on Nov. 18th) that the tower indeed is a nuisance and annoyance and must be removed. The judges did not address the issue of what constitutes a building since they only needed to find one violation of the deed restrictions.

The only alternative left for the Browsers is to sue in Federal court. The cost to do this will be about \$20,000 and they have appealed to the American Radio Relay League to continue their legal battle. They maintain "The successful outcome will ultimately benefit all U.S. amateurs."

• **Up to the minute update!** At the close of the fifth round (Dec. 9th) of the FCC's spectrum auction for licenses to provide broadband personal communications services (PCS), total bids for all licenses stood at \$752,753,113 and three licenses have now been assigned. It certainly is a long way to \$15 billion! The auction began Dec. 5 with one round per day for the first week. It is anticipated that there will now be two rounds per day beginning Dec. 12.

The FCC will determine the number of rounds to be conducted per day based upon the auction's progress. The auction will break for the Christmas holiday from the close of bidding on Dec. 21, 1994 through Jan. 3, 1995.

The FCC is using some very innovative ways to allow the public to "watch" the auctions over the Internet or even a fax machine. You can connect to the FCC's anonymous "ftp fcc.gov" file server or call their fax machine at 202-418-2830. By pressing a number, you can download auction information.

A private study by David Roddy of Economics and Technology, Inc., says many spectrum winners will not survive if they pay \$10 per potential customer. He thinks the value is more like \$2 to \$5 - which brings the government take down substantially! The \$10 figure is an evaluation made by the FCC's Office of Management and Budget for the purpose of calculating incoming revenue to the U.S. treasury from auctions.

## Position Paper on Packet Bulletins - Approved by the Tucson Amateur Packet Radio Board of Directors

There has been a recent flurry of activity on the packet networks as documented on TAPR's BBS Special Interest Group over some packet bulletins issued by Frederick Sober, AB6GQ, an Official Observer Coordinator in the Sacramento Valley section of the ARRL. The concern expressed by AB6GQ is that packet bulletins whose contents do not relate to amateur radio are in violation of Part 97. I have reviewed AB6GQ's bulletin, two letters from (FCC Personal Radio Branch Chief) Johnny Johnston, and discussed the matter personally with AB6GQ by phone on October 23rd.

AB6GQ was contacted by several local packet BBS sysops who were concerned over the content of bulletins addressed, for example, to ALL @ ALLUS, ALL @ WW, and so forth. The content of many of these bulletins did not include ham radio-related subject material, and they wondered if this was a violation of Part 97.

Frederick was advised by his section manager to get in touch with League headquarters. A League Regulatory Information staffer suggested he contact the FCC directly and he was referred to Washington. An exchange of correspondence with Johnny Johnston ensued. AB6GQ has been advised that the League is going to 'undertake an educational effort' about which something will appear in QST after the first of the year. Frederick advises he is going to wait for further word through the League chain of command for his next, if any, action regarding packet bulletins.

Because of statements to other amateurs from an Official Observer Coordinator, and an exchange of correspondence with an FCC branch chief, Greg Jones, President of TAPR, received numerous phone calls asking for TAPR's position on this matter. Greg discussed this situation with several League officials and other respected advisers prior to discussing it with the TAPR Board of Directors.

To be succinct, most of the flame wars and great debates over permissible communications exhibit a problem with semantics, not a lack of specificity in the rules. Packet\* is not some mutant communications form that is not definable by the rules. Packet is no more or less privileged than any other form of amateur communications. (*\*packet is used here, but this argument extends to all legal forms of amateur digital communications which are used for the forwarding of bulletins*)

Part 97 comes complete with its own dictionary, which includes a list of definitions for the terms used in the document. Two definitions that are either overlooked or misinterpreted by many are 'broadcasting' and 'informational bulletin.' 'Broadcasting' specifically means transmissions intended for reception by the general public (see §97.3 (10)). The term 'informational bulletin,' defined by Part §97.3 (23) has no relation to what we refer to as a packet 'bulletin.' Part 97 defines an 'informational bulletin' as a one-way transmission to hams of a message of subject matter composed solely of interest to the amateur service. A good example of an informational bulletin is a transmission of ARRL bulletins from W1AW. To conclude that all of this means that a packet bulletin must be confined to amateur-only subject material is using terribly convoluted logic. Except for unproto, there is no one-way packet mode. It takes two to

tango. A packet bulletin is entered on a BBS from the originating station in a two-way communication. From then on out, that packet bulletin is a third-party message. If it gets forwarded from one BBS to another, it is a third-party message being forwarded during a two-way communication.

Section §97.113 lists prohibited communications and their exceptions. There is no specific prohibition against content with potentially controversial or frivolous subject material. This particular problem was because of message content. There is general agreement that many of the bulletins traversing the network aren't worth the electricity used to forward them. Studies in several metropolitan areas show that over 70% of the bulletins NEVER get read. They just get listed. This means users are being very selective about what they read. They DO have a choice. So do sysops. The process of reducing the amount of what many of us consider to be 'noise' on our boards begins with each of us exercising leadership at home. If someone posts a SALE @ ALLUS bulletin on your board trying to unload a camping tent, tell them nicely that this isn't appropriate. If you have a religious fanatic or political alarmist climbing on the electronic soapbox (and that soapbox has your call sign stenciled on the side), it's time for a heart-to-heart.

Easy? Not always. Whoever said that running a BBS was gonna be easy? What are you doing to get the word out that packet radio, while sometimes loose, is not a free-for-all. Ham radio, ALL facets of ham radio, because of the wide constituency we have, is a place where people have to be responsible. It's much harder to educate than legislate, but which do you think has the more effective results?

The lessons learned: If you've got a question about the rules, use the resources available to you WITHIN the amateur community INSTEAD of making an end run straight to the Commission. Document who you speak with and what was said. Get whatever you can in writing. Think of the potential impact on ALL of amateur radio when a small chunk of the overall activity (such as packet in relation to everything else) is the focus of possible new regulation or enforcement. This is not to suggest that the rules be violated or that anyone stick their head in the sand about abuses that may exist. It is better to try to take care of business ourselves, as we are encouraged to do in the rules, than to invite possible over-regulation by the FCC.

This issue may be put to rest forever preferably by the League setting the record straight that packet bulletins are not one-way transmissions or broadcasting, and that §97.113 is explicit about permissible content of amateur communications.

Incidentally, I found AB6GQ to be very open about this incident and very surprised to find himself at the eye of a hurricane. He admits to a degree of initial naivete in his effort to be a responsible OO (and now an OOC). Frederick wants everyone to know that he and his team of OO's don't have a hidden agenda and most importantly, they aren't vigilantes. They wanted some answers to questions about packet bulletins. Some missteps and miscommunications (by numerous people) led to something being given far more relevance than it deserved.

submitted by **Dave Wolf W05H**, TAPR BBS SIG Chair  
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